

MSc in Physics, Biological Physics and Computational Biology

LUND UNIVERSITY, SWEDEN

- Master of Science in Physics
- 2 years, full-time, 120 ECTS credits
- Department of Astronomy and Theoretical Physics
- Lund Campus
- Application deadline: January 2021
- Programme start: August 2021

Programme overview

Physics teaches us how to construct and apply models of phenomena in the world around us, spanning scales from the very smallest to the very largest. Biology has long been a rich source of open questions, but we cannot understand life without understanding the physics and mathematics that govern living things. For that reason, many renowned physicists, such as Richard Feynman, Wolfgang Pauli, Niels Bohr, Max Delbrück and Erwin Schrödinger, turned their attention to biological problems and in some cases made substantial contributions to new fields such as molecular biology.

Biology has increasingly become a quantitative science, where scientists from different backgrounds together address a range of unresolved problems, for example, how biomolecules adopt their specific shape, how they interact in cells and how cells divide and communicate. The methods of theoretical physics, including statistical methods, machine learning, modelling and simulation, form an invaluable toolbox for approaching many of these problems.

The Department of Astronomy and Theoretical Physics offers a physics programme with specialisation in biological physics and computational biology, which combines a solid base of courses in theoretical and mathematical physics with courses in other subjects taught at the relevant departments, for example, chemistry and biology.

As a Master's student, you will become part of a vibrant research community at the Computational Biology and Biological Physics division, engaged in cutting-edge theoretical studies of biological problems in collaboration with

experimental groups worldwide. The programme includes a Master's project carried out within one of the research groups.

Programme modules/courses

The programme offers a wide range of courses. Some suggested courses are Computational Physics, Theoretical Biophysics, Artificial Neural Networks and Deep Learning, Systems Biology, Statistical Mechanics and Experimental Biophysics.

At the end of the programme, you complete an individual Master's degree project corresponding to at least 30 ECTS credits.

Please see www.fysik.lu.se/english/education/start-studying/masters-programme for information on compulsory and elective courses.

Career prospects

A specialisation in biological physics will give you opportunities to pursue a wide variety of careers. Whereas some students go on to do a PhD in theoretical physics or computational biology, it is also possible to find suitable careers outside academia, for example in the fields of information and communication technology or biotechnology, where advanced programming and modelling are sought after.

In addition, MAX IV and the upcoming ESS laboratory in Lund will create new opportunities for graduates with a degree in physics, including biological physics and computational biology.

Entry requirements and how to apply

ENTRY REQUIREMENTS

A Bachelor's degree of at least 180 credits in physics or the equivalent. The degree must include at least 90 credits in physics. English Level 6 (equivalent to IELTS 6.5, TOEFL 90). See www.lunduniversity.lu.se for details on English proficiency levels.





HOW TO APPLY

1. Apply online: Go to www.lunduniversity.lu.se/biological-physics. Click on "Apply" and follow the instructions for the online application at the Swedish national application website www.universityadmissions.se.

Rank the chosen programmes in order of preference.

2. Submit your supporting documents:

- **General supporting documents:** Check what documents you need to submit (i.e. official transcripts, degree diploma/proof of expected graduation, translations, proof of English, passport) and *how* you need to submit them at www.universityadmissions.se.
- **Programme-specific supporting documents:** When applying for this programme, you must also submit a 'Summary Sheet' with your application. See the programme webpage for details.

3. Pay the application fee (when applicable).

SELECTION CRITERIA/ADDITIONAL INFORMATION

The selection will be based on grades awarded for previous academic courses, particularly qualifying courses, and the statement of purpose (from the applicant's 'Summary Sheet').

TUITION FEES

There are no tuition fees for EU/EEA citizens. For non-EU/EEA citizens, the tuition fee for this programme is SEK 145 000 per year. See www.lunduniversity.lu.se for details on tuition fees.

About the Department of Astronomy and Theoretical Physics

The Department of Astronomy and Theoretical Physics spans a vast range of research activities, including theoretical astrophysics, observational astronomy and theoretical particle physics. The Computational Biology and Biological Physics group applies many of the same mathematical and computational methods and tools, but to questions linked to various

areas of biology. Of special relevance for the Master's programme in biological physics is the research on, for example, DNA barcoding, stem cell regulation, protein aggregation and neural network classifiers.

About Lund University

Lund University was founded in 1666 and is repeatedly ranked among the world's top 100 universities. The University has 40 000 students and more than 8 000 staff based in Lund, Helsingborg and Malmö. We are united in our efforts to understand, explain and improve our world and the human condition.

Lund is the most popular study location in Sweden. The University offers one of the broadest ranges of degree programmes and courses in Scandinavia, based on cross-disciplinary and cutting-edge research. Because of its wide disciplinary range, interdisciplinary collaborations and engagement with wider society, Lund University is particularly well equipped to meet complex societal challenges. With partner universities in around 70 countries, the University's profile is distinctly international.

Lund University has an annual turnover of more than EUR 830 million, of which two-thirds go to research in our nine faculties, enabling us to offer one of the strongest and broadest ranges of research in Scandinavia.

Learn more at www.lunduniversity.lu.se

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CONTACT

Programme webpage

www.lunduniversity.lu.se/biological-physics

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